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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,522	10/06/2004	Hui Wang	495152001100	9301

7590 05/16/2007

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EXAMINER	
PATEL, TAYAN B	
ART UNIT	PAPER NUMBER
1709	

MAIL DATE	DELIVERY MODE
05/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/510,522	WANG ET AL.	
	Examiner	Art Unit	
	Tayan B. Patel Esq.	1709	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 October 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 6, and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Hongo et al. (US 6294059).

With regard to claim 1, Hongo et al. discloses an apparatus for wafers, W, comprising: a module for storing a wafer, 1-1 (See figure 3; See also column 6-7, lines 42-6), a plurality of vertically stacked processing modules, 41 and 42, (See figure 7) for at least one of electro-polishing the wafer, unit 5 (See figure 3; See also column 6, lines 15-25), and electroplating the wafer, 2 & 2' (See figure 3; See also column 6, lines 57-67); a cleaning module, 10 (See figure 3; See also column 6, lines 40-57) ; and a robot, 16 (See figure 6; See also column 7, lines 52-65), for transferring the wafer between the module for storing, the processing module, and the cleaning module, wherein the apparatus is divided into at least two sections with separate frames (See figure 7; See also column 4, lines 34-38).

With regard to claim 2, Hongo et al. further discloses a pre-alignment module/loading unit, 1, to align the wafer prior to processing. See figure 3; See also column 6, lines 40-65.

With regard to claim 6, Hongo et al. further discloses a liquid delivery system/slurry supply unit that provides solution to the module for processing. See column 8, lines 21-29.

With regard to claim 10, Hongo et al. further discloses a scrubber and tower that processes exhaust gases from the modules. See column 9, lines 14-21.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hongo et al (US 6294059) in view of Harris et al. (US 6439824).

With regard to claim 4, Hongo et al. discloses all of the claimed limitations as discussed with respect to claim 1 above, yet fails to discuss the robot as removable by rolling or sliding out form one of the at least two sections.

Harris et al. discloses an apparatus for processing semiconductor wafers wherein a process robot, 60, moves on a lateral rail to transfer wafers between modules, wherein the robot leaves the confines of the process assembly, in order to provide an improved immersion module subsystem. See figure 1; See also column 3, lines 1-25.

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to use the rail system in Harris et al. in the apparatus of Hongo et al. in order to provide an improved immersion module system.

6. Claims 3, 5, 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hongo et al (US 6294059) in view of Woodruff et al. (US 2001/0043856).

With regard to claims 3 and 5, Hongo et al. discloses all of the claimed limitations as discussed with respect to claim 1 above, yet fails to discuss a second end effector for picking up and transferring wafers to processing modules.

Woodruff et al. discloses a transfer device for handling microelectronic work pieces where there are first and second end-effectors, 250a and 250b, for accessing processing stations in order to provide access to any of the chambers in the tool and not limited by the motion of the robot and/or the end-effectors. See page 2, paragraph 0018; See also page 6, paragraph 0050.

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to use the second end effector in Woodruff et al. in the apparatus of Hongo et al. in order to provide access to any of the chambers in the tool and not limited by the motion of the robot and/or the end-effectors.

With regard to claim 11, Hongo et al discloses a method for electro-polishing and electro-plating a semiconductor wafer comprising: transferring a wafer, W, to one of a plurality of vertically stacked processing modules (See figure 7) with a first end effector/hand, 164, (See column 13, lines 36-48); electro-polishing the wafer, unit 5 (See figure 3; See also column 6, lines 15-25) and electroplating the wafer, 2 & 2' (See figure 3; See also column 6, lines 57-67); cleaning the wafer in the cleaning module, 10 (See figure 3; See also column 6, lines 40-57) wherein the process assembly is divided into at least two section characterized by separate frames (See figure 7; See also column 4, lines 34-38). However, Hongo et al. fails to discuss transferring the wafer from the processing module to a cleaning module with a second end effector.

Woodruff et al. discloses a transfer device for handling microelectronic work pieces where there are first and second end-effectors, 250a and 250b, are used for transferring the wafer from the processing module to a cleaning module in order to provide access to any of the chambers in the tool and not limited by the motion of the robot and/or the end-effectors. See page 2, paragraph 0018; See also page 6, paragraph 0050.

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to use the second end effector for transferring the wafer from the

processing module to a cleaning module in Woodruff et al. in the apparatus of modified Hongo et al. in order to provide access to any of the chambers in the tool and not limited by the motion of the robot and/or the end-effectors.

With regard to claim 14, modified Hongo et al discloses all of the claimed limitations as discussed with respect to claim 11 above, wherein Hongo et al. further discloses a scrubber and tower that processes exhaust gases from the modules, whereby they are eventually removed. See column 9, lines 14-21.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hongo et al (US 6294059) as applied to claim 6 above, in view of Anderson et al. (US 4430178).

With regard to claim 7, Hongo et al. discloses all of the claimed limitations as discussed with respect to claim 6 above, yet fails to discuss a surge suppressor.

Anderson et al. discloses an electroplating apparatus where a surge suppressor is used in order to reduce high voltage spikes. See column 9, lines 28-31.

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to use the surge suppressor in Anderson et al. in the apparatus of Hongo et al. in order to reduce high voltage spikes.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hongo et al. (US 6294059) as applied to claim 6 above, in view of Tomoyasu et al. (US 6106737).

With regard to claim 8, Hongo et al. discloses all of the claimed limitations as discussed with respect to claim 6 above, wherein Hongo et al. discusses forming a layer/film (See column 3, lines 59-67), yet fails to discuss a controller to modulate the flow rate of process liquid.

Tomoyasu et al. discloses a method for processing a wafer comprising a liquid mass flow controller, 736, in order to control the flow rate of liquid supplied from the container. See column 17, lines 14-49.

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to use the controller in Tomoyasu et al. in the apparatus of Hongo et al. in order to control the flow rate of liquid supplied from the container.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hongo et al. (US 6294059) as applied to claim 6 above, in view of Kimura et al. (US 2001/0024691).

With regard to claim 9, Hongo et al. discloses all of the claimed limitations as discussed with respect to claim 6 above, wherein Hongo et al. discusses a liquid (See column 9, lines 14-32), yet fails to discuss a containment tray.

Kimura et al. discloses a semiconductor substrate processing apparatus for forming interconnects by filling holes in the substrate wherein a plating liquid tray, 2-2, is used in order to store a plating liquid. See page 13, paragraph 0184; See also figure 7.

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to use the tray in Kimura et al. in the apparatus of modified Hongo et al. in order to store a plating liquid.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hongo et al (US 6294059) in view of Woodruff et al. (US 2001/0043856) as applied to claim 11 above, and further in view of Harris et al. (US 6439824).

With regard to claim 12, Hongo et al. discloses all of the claimed limitations as discussed with respect to claim 11 above, yet fails to discuss a robot configured to slide or roll out of the process assembly.

Harris et al. discloses an apparatus for processing semiconductor wafers wherein a process robot, 60, moves on a lateral rail to transfer wafers between modules in the process assembly, wherein the robot leaves the confines of the process assembly, in order to provide an improved immersion module subsystem. See figure 1; See also column 3, lines 1-25.

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to use the rail system in Harris et al. in the apparatus of modified Hongo et al. in order to provide an improved immersion module subsystem.

9. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hongo et al (US 6294059) in view of Woodruff et al. (US 2001/0043856) as applied to claim 11 above, and further in view of Anderson et al. (US 4430178).

With regard to claim 13, Hongo et al. discloses all of the claimed limitations as discussed with respect to claim 11 above, wherein liquid is delivered to the processing module through a supply line (See column 9, lines 28-31). However, modified Hongo et al. yet fails to discuss a surge suppressor.

Anderson et al. discloses an electroplating apparatus where a surge suppressor is used in order to reduce high voltage spikes. See column 8, lines 21-29.

It would have been obvious to one of ordinary skill in the art at the time the invention was claimed to use the surge suppressor in Anderson et al. in the apparatus of modified Hongo et al. in order to reduce high voltage spikes.

10. ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tayan B. Patel Esq. whose telephone number is (571) 272-9806. The examiner can normally be reached on Monday-Thursday, 7:30-5:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Neckel D. Alexa can be reached on (571)272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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TBP

ALEXA D. NECKEL
SUPERVISORY PATENT EXAMINER